

**WE CLAIM:**

1. A process for upgrading firmware in a thin client comprising:  
sending an FTP request for a first firmware upgrade from the thin client to a first FTP server;  
receiving the first firmware upgrade in response at the thin client from the first FTP server;  
upgrading the firmware in the thin client with the first firmware upgrade;  
sending an FTP request for a second firmware upgrade from the thin client to a second FTP server that is different from the first FTP server;  
receiving the second firmware upgrade in response at the thin client from the second FTP server; and  
upgrading the firmware in the thin client with the second firmware upgrade.
2. The process of claim 1 further comprising:  
sending an FTP request for information about the first firmware upgrade from the thin client to the first FTP server;  
receiving the information about the first firmware upgrade in response at the thin client from the FTP server;  
comparing the information about the first firmware upgrade with information about the firmware in the thin client; and  
upgrading the firmware in the thin client with the first firmware upgrade only if the comparing indicates that the firmware in the thin client should be upgraded with the first firmware upgrade.
3. The process of claim 2 further comprising:  
sending an FTP request for information about the second firmware upgrade from the thin client to the second FTP server;

receiving the information about the second firmware upgrade in response at the thin client from the FTP server;

comparing the information about the second firmware upgrade with information about the firmware in the thin client; and

upgrading the firmware in the thin client with the second firmware upgrade only if the comparing indicates that the firmware in the client should be upgraded with the second firmware upgrade.

4. The process of claim 1 wherein the first firmware upgrade is different than the second firmware upgrade.

5. The process of claim 4 wherein the first firmware upgrade is an operating system and the second firmware upgrade is an add-on.

6. The process of claim 1 further comprising:

receiving an address for the first FTP server and an address for the second FTP server;

storing the addresses within the thin client;

reading the address for the first FTP server from within the thin client;

sending the request to the first FTP server at the address for the first FTP server that was read;

reading the address for the second FTP server from within the thin client; and

sending the request to the second FTP server at the address for the second FTP server that was read.

7. The process of claim 6 wherein the receiving the addresses includes:

presenting a dialog box to an operator of the thin client; and

receiving addresses entered into the dialog box by the operator.

8. The process of claim 6 wherein the receiving the addresses includes receiving the addresses over a computer network from a location that is remote from the thin client.
9. A process for upgrading firmware in a thin client comprising:
  - sending an FTP request for a firmware upgrade or information about the upgrade from the thin client to a first FTP server;
  - not receiving the firmware upgrade or information about the upgrade in response at the thin client from the first FTP server;
  - sending an FTP request for the same firmware upgrade from the thin client to a second FTP server that is different from the first FTP server;
  - receiving the firmware upgrade in response at the thin client from the second FTP server; and
  - upgrading the firmware in the thin client with the firmware upgrade.
10. The process of claim 9 wherein the firmware upgrade or information about the upgrade is not received from the first FTP server because the first FTP server is busy performing other downloads.
11. The process of claim 9 wherein the firmware upgrade or information about the upgrade is not received from the first FTP server because the first FTP server is not functioning.
12. A process for upgrading firmware in a thin client comprising:
  - booting up the thin client; and
  - automatically launching a firmware upgrade loader program in the thin client without operator intervention during the booting up that:
    - reads an address of an FTP server from a memory within the thin client;
    - sends an FTP request for a firmware upgrade from the thin client to the FTP server at the address that was read;

receives the firmware upgrade in response at the thin client from the FTP server; and

upgrades the firmware in the thin client with the firmware upgrade.

13. The process of claim 12 further comprising re-booting the thin client after the firmware is upgraded.

14. The process of claim 12 wherein the firmware upgrade loader program further:

reads an address of a second FTP server from a memory within the thin client that is different from the address of the first-mentioned FTP server;

sends an FTP request for a second firmware upgrade from the thin client to the second FTP server at the address of the second FTP server that was read;

receives the second firmware upgrade in response at the thin client from the second FTP server; and

upgrades the firmware in the thin client with the second firmware upgrade.

15. A system for upgrading firmware in a thin client comprising:

storage media containing computer programming instructions that implement the following when the instructions are performed by a processing system in communication with a network interface:

sending an FTP request for a first firmware upgrade from the thin client to a first FTP server;

receiving the first firmware upgrade in response at the thin client from the first FTP server;

upgrading the firmware in the thin client with the first firmware upgrade;

sending an FTP request for a second firmware upgrade from the thin client to a second FTP server that is different from the first FTP server;

receiving the second firmware upgrade in response at the thin client from the second FTP server; and

upgrading the firmware in the thin client with the second firmware upgrade;

a network interface; and

a processing system configured to communicate with the storage media and the network interface and to perform the programming instructions.

16. The system of claim 15 wherein the programming instructions also implement the following when the instructions are performed by a processing system in communication with a network interface:

sending an FTP request for information about the first firmware upgrade from the thin client to the first FTP server;

receiving the information about the first firmware upgrade in response at the thin client from the FTP server;

comparing the information about the first firmware upgrade with information about the firmware in the thin client; and

upgrading the firmware in the thin client with the first firmware upgrade only if the comparing indicates that the firmware in the thin client should be upgraded with the first firmware upgrade.

17. The system of claim 16 wherein the programming instructions also implement the following when the instructions are performed by a processing system in communication with a network interface:

sending an FTP request for information about the second firmware upgrade from the thin client to the second FTP server;

receiving the information about the second firmware upgrade in response at the thin client from the FTP server;

comparing the information about the second firmware upgrade with information about the firmware in the thin client; and

upgrading the firmware in the thin client with the second firmware upgrade only if the comparing indicates that the firmware in the client should be upgraded with the second firmware upgrade.

18. The system of claim 15 wherein the programming instructions also implement the following when the instructions are performed by a processing system in communication with a network interface:

receiving an address for the first FTP server and an address for the second FTP server;

storing the addresses within the thin client;

reading the address for the first FTP server from within the thin client;

sending the request to the first FTP server at the address for the first FTP server that was read;

reading the address for the second FTP server from within the thin client; and

sending the request to the second FTP server at the address for the second FTP server that was read.

19. The system of claim 18 wherein the programming instructions also implement the following as part of the receiving the addresses when the instructions are performed by a processing system in communication with a network interface:

presenting a dialog box to an operator of the thin client; and

receiving addresses entered into the dialog box by the operator.

20. The system of claim 18 wherein the programming instructions also implement the following as part of the receiving the addresses when the instructions are performed by a processing system in communication with a network: receiving the addresses over a computer network from a location that is remote from the thin client.

21. A system for upgrading firmware in a thin client comprising:

storage media containing computer programming instructions that implement the following when the instructions are performed by a processing system in communication with a network interface:

sending an FTP request for a firmware upgrade or information about the upgrade from the thin client to a first FTP server;

not receiving the first firmware upgrade or information about the upgrade in response at the thin client from the first FTP server if the first FTP server is busy or malfunctioning;

sending an FTP request for the same firmware upgrade from the thin client to a second FTP server that is different from the first FTP server;

receiving the firmware upgrade in response at the thin client from the second FTP server; and

upgrading the firmware in the thin client with the second firmware upgrade;

a network interface; and

a processing system configured to communicate with the storage media and the network interface and to perform the programming instructions.

22. The system of claim 21 further comprising:

the first FTP server containing the firmware upgrade; and

the second FTP server containing the same firmware upgrade.

23. A system for upgrading firmware in a thin client comprising:

storage media containing computer programming instructions that load during boot up of the thin client and implement the following when the instructions are performed by a processing system in communication with a network interface:

read an address of an FTP server from a memory within the thin client;

send an FTP request for a firmware upgrade from the thin client to the FTP server at the address that was read;

receive the firmware upgrade in response at the thin client from the FTP server; and

upgrade the firmware in the thin client with the firmware upgrade;

a network interface; and

a processing system configured to communicate with the storage media and the network interface, to boot up the thin client, and to perform the programming instructions during the boot up.

24. The system of claim 21 wherein the programming instructions also implement the following when the instructions are performed by a processing system in communication with a network interface: direct the re-booting of the thin client after the firmware is upgraded.

25. The system of claim 21 wherein the programming instructions also implement the following when the instructions are performed by a processing system in communication with a network interface:

read an address of a second FTP server from a memory within the thin client that is different from the address of the first-mentioned FTP server;

send an FTP request for a second firmware upgrade from the thin client to the second FTP server at the address of the second FTP server that was read;

receive the second firmware upgrade in response at the thin client from the second FTP server; and

upgrade the firmware in the thin client with the second firmware upgrade.

26. Computer-readable storage media containing computer programming instructions that implement the following when the instructions are performed by a processing system in communication with a network interface in a thin client:

sending an FTP request for a first firmware upgrade from the thin client to a first FTP server;



receiving the first firmware upgrade in response at the thin client from the first FTP server;

upgrading the firmware in the thin client with the first firmware upgrade;

sending an FTP request for a second firmware upgrade from the thin client to a second FTP server that is different from the first FTP server;

receiving the second firmware upgrade in response at the thin client from the second FTP server; and

upgrading the firmware in the thin client with the second firmware upgrade.

27. The storage media of claim 26 wherein the programming instructions also implement the following when the instructions are performed by a processing system in communication with a network interface:

sending an FTP request for information about the first firmware upgrade from the thin client to the first FTP server;

receiving the information about the first firmware upgrade in response at the thin client from the FTP server;

comparing the information about the first firmware upgrade with information about the firmware in the thin client; and

upgrading the firmware in the thin client with the first firmware upgrade only if the comparing indicates that the firmware in the thin client should be upgraded with the first firmware upgrade.

28. The storage media of claim 27 wherein the programming instructions also implement the following when the instructions are performed by a processing system in communication with a network interface:

sending an FTP request for information about the second firmware upgrade from the thin client to the second FTP server;

receiving the information about the second firmware upgrade in response at the thin client from the FTP server;

comparing the information about the second firmware upgrade with information about the firmware in the thin client; and

upgrading the firmware in the thin client with the second firmware upgrade only if the comparing indicates that the firmware in the client should be upgraded with the second firmware upgrade.

29. The storage media of claim 26 wherein the programming instructions also implement the following when the instructions are performed by a processing system in communication with a network interface:

receiving an address for the first FTP server and an address for the second FTP server;

storing the addresses within the thin client;

reading the address for the first FTP server from within the thin client;

sending the request to the first FTP server at the address for the first FTP server that was read;

reading the address for the second FTP server from within the thin client; and

sending the request to the second FTP server at the address for the second FTP server that was read.

30. The storage media of claim 29 wherein the wherein the programming instructions also implement the following as part of the receiving the addresses when the instructions are performed by a processing system in communication with a network interface:

presenting a dialog box to an operator of the thin client; and

receiving addresses entered into the dialog box by the operator.

31. The storage media of claim 29 wherein the programming instructions also implement the following as part of the receiving the addresses when the instructions are performed by a processing system in communication with a network interface:

receiving the addresses over a computer network from a location that is remote from the thin client.

32. Computer-readable storage media containing computer programming instructions that load during boot up of the thin client and implement the following when the instructions are performed by a processing system in communication with a network interface:

- sending an FTP request for a firmware upgrade or information about the upgrade from the thin client to a first FTP server;

- not receiving the first firmware upgrade or information about the upgrade in response at the thin client from the first FTP server;

- sending an FTP request for the same firmware upgrade from the thin client to a second FTP server that is different from the first FTP server;

- receiving the firmware upgrade in response at the thin client from the second FTP server; and

- upgrading the firmware in the thin client with the second firmware upgrade.

33. Computer-readable storage media containing computer programming instructions that load during boot up of the thin client and implement the following when the instructions are performed by a processing system in communication with a network interface:

- reading an address of an FTP server from a memory within the thin client;

- sending an FTP request for a firmware upgrade from the thin client to the FTP server at the address that was read;

- receiving the firmware upgrade in response at the thin client from the FTP server; and

- upgrading the firmware in the thin client with the firmware upgrade.

34. The storage media of claim 33 wherein the programming instructions also implement the following when the instructions are performed by a processing system in communication with a network interface: direct the re-booting of the thin client after the firmware is upgraded.

35. The storage media of claim 33 wherein the programming instructions also implement the following when the instructions are performed by a processing system in communication with a network interface:

read an address of a second FTP server from a memory within the thin client that is different from the address of the first-mentioned FTP server;

send an FTP request for a second firmware upgrade from the thin client to the second FTP server at the address of the second FTP server that was read;

receive the second firmware upgrade in response at the thin client from the second FTP server; and

upgrade the firmware in the thin client with the second firmware upgrade.